

# REMARKS

Claims 1-3, 5 and 8-20 are pending. No claim amendments are made herein. The applicant respectfully requests reconsideration of the claims based on the following showing of chemical distinctness.

The (meth)acrylate (C) of the claimed invention has the following features (3) and one of (1) and (2) ((1)+(3) or (2)+(3)):

- (1) A (meth)acrylate which is obtained by reacting a polyetherpolyol having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit with a (meth)acrylic acid.
- (2) A (meth)acrylate which is obtained by reacting a polyisocyanate having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit with a polyetherpolyol having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit under the conditions that an isocyanate group of the polyisocyanate is in excess of a hydroxyl group of the polyol, with a (meth)acrylate having a hydroxyl group.
- (3) A (meth)acrylate having a number average molecular weight of 500 to 10,000, which contains 20 to 80% by weight of an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit and contains no active hydrogen atom.

Here, the (meth)acrylate (C) having the features of (1) and (3) above is denoted by the first component (C), and the (meth)acrylate (C) having the features of (2) and (3) is denoted by the second component (C), below (see Product (C) column).

Table 1: (Meth)acrylate (C) of the present invention

	Raw material of the (meth)acrylate (C)	Intermediate	Product (C)	Reaction site
(1)	cyclic polyetherpolyol		(meth)acrylate	OH/COOH
	(meth)acrylic acid			
(2)	cyclic polyisocyanate	NCO urethane prepolymer reaction	urethane(meth)acrylate	OH/NCO
	cyclic polyetherpolyol			
	(meth)acrylate having a OH group			

(3)	<ul style="list-style-type: none"><li>* containing 20 to 80% by weight of an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit,</li><li>* containing no active hydrogen atom, and</li><li>* having a number average molecular weight of 500 to 10,000</li></ul>
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The instant specification, page 12, second paragraph, states in part:

urethane (meth)acrylate [that is, the second component (C)] obtained by reacting a polyisocyanate having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit and a (meth)acrylate having a hydroxyl group and, if necessary, a polyol.

In addition, p.12, third paragraph states in part:

Examples of the polyol having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit, which can be used as the raw material of the (meth)acrylate, include polyesterpolyol, polyetherpolyol and polycarbonatepolyol, each having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit. (emphasis added)

That is, the *cyclic polyetherpolyol is selectively used to produce the second component (C)* in the claimed invention. *Polyesterpolyol and polycarbonatepolyol are not selected, that is, they are not used in the present invention.*

**Claims 1-3, 8-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al (US20020055030A1) in view of Butler (US6251308B1), evidenced by Fujimoto et al (W002/44285) relied on English Translation (US07132460B2).** (Office Action, page 2)

Okumura discloses urethane (meth)acrylate, which is a reaction product of diisocyanate, polyol, and (meth)acrylate having an hydroxyl group. However, Okumura only discloses C<sub>2-12</sub> alkylene glycol, polyether diol such as polyoxy C<sub>2-4</sub> alkylene glycol, polyester diols, polycarbonate diols, as a diol component ([0048]). Thus, *Okumura only discloses aliphatic*

***polyetherpolyols, and does not disclose cyclic polyetherpolyols which are used in the claimed invention.***

The rejection asserts that Fujimoto discloses that an aromatic polycarbonate diol is used to produce urethane (meth)acrylate. The rejection alleges that an aromatic polyether polyol is commonly used to produce urethane (meth)acrylate by combining Okumura and Fujimoto.

Fujimoto discloses urethane acrylate, but relates to an active energy ray curable composition for coating optical disk. That is, Fujimoto neither disclose nor suggest the improvement of moldability of a composition for a conductivity resin composition. In addition, ***Fujimoto also neither discloses nor suggests the combination usage between urethane acrylate and vinyl ester resin.*** Of course, Fujimoto neither discloses nor suggests the combination between the urethane-modified vinyl ester resin (B) and the acrylate (C) in the claimed invention too. Furthermore, Fujimoto neither discloses nor suggests the conductive filler (A) used in the claimed invention.

The rejection alleges that Fujimoto is used for evidence that polycarbonate diol has aromatic and aliphatic structure. However, one of the raw materials for the component (C) is polyether polyol, and ***not polycarbonate diol***, as shown in Table 2 below. Polycarbonate diol, which the rejection notes, is not completely related to the present invention. ***As explained above, since polycarbonate diol does not have an ether bond, it is not polyether polyol.***

Therefore, the applicant asserts that there is no bases that urethane acrylate, which is disclosed in Okumura as one example of the radical-polymerizable resins, is combinable with Fujimoto, as alleged.

In addition, the present invention relates to a conductive resin composition. However, the rejection separates the components in the composition, and compares each component to the citations. Even if the components in the composition were well known, the composition is new and provides unique effects which are not obtained by any cited art. Thus, the claimed invention is new and non-obvious over prior art.

Moreover, the rejection comments, "Applicants argue that ... Furthermore, the polycarbonate diol of Fujimoto does not correspond to the urethane acrylate which is one of the polyester diol used in component (C) (page 9, current Remarks)." The Examiner is correct, this was an inadvertent error. The sentence should read correctly "polyether diol."

As shown in the enclosed Table 2, when *Okumura and Fujimoto are combined, it may be clear that a cyclic polycarbonate diol is used to produce a urethane (meth)acrylate. However, the claimed invention uses polyetherpolyol, not cyclic polycarbonate diol.* Since polycarbonate diol does not have an ether bond, polycarbonate diol never belongs to polyetherpolyol. Even if Okumura and Fujimoto are combined, it is not clear that a cyclic polyether polyol is used to produce a urethane (meth)acrylate.

For at least this reason, the component (C) in the claimed invention cannot be achieved by combining Okumura and Fujimoto.

Table 2: Comparison between Present Invention, Okumura, and Fujimoto

Present Invention	Product	Raw materials of the Product		
		cyclic polyisocyanate	cyclic polyetherpolyol	(meth)acrylate having a OH group
Okumura	[0046] urethane (meth)acrylate	[0048] diisocyanate component (e.g., an aromatic diisocyanate such as polylenediisocyanate...)	[0048] diol such as C2-12 alkylene glycol, <u>polyether diol such as polyoxy C2-4 alkylene glycol</u> , polyester diol's, and <u>polycarbonate diols</u>	[0047] hydroxy C2-6 alkyl (meth)acrylate
Fujimoto	Column 3, 2nd paragraph urethane (meth)acrylate compound (A)	(a3) diisocyanate compounds	(a1) amide-containing compounds having at least one amide group and at least two hydroxyl group in the molecule, (a2), column 4, lines 18 to 19 poly-hydric alcohol compounds other than the above-mentioned component (a1) such as <u>aliphatic polycarbonate diol</u>	(a4) Hydroxyl group-containing (meth)acrylates

In the Office Action dated February 17, 2009, page 3, second paragraph, the rejection comments "in view of substantially identical (meth)acrylate disclosed by prior art, and by applicants, it is examiner's position to believe that the (meth)acrylate of prior art would inherently possess Mn and aromatic structural unit as claimed." The applicant believes that the reasons for the rejection is that it incorrectly relies on feature (3), previously mentioned.

***However, the (meth)acrylate (C) has also the features (1) or (2), not only the feature (3).***

Okumura does not disclose the component (C), as explained above. Okumura was in fact cited in the corresponding EP and JP applications, and both the applications were granted as patents over Okumura.

The component (B) in the claimed invention is a urethane-modified epoxy (meth)acrylate (B) obtained by reacting an epoxy (meth)acrylate (b-1) with a polyisocyanate (b-2), and the epoxy (meth)acrylate (b-1) being obtained by an addition reaction of an epoxy resin having an aromatic cyclic structural unit and/or an aliphatic cyclic structural unit and a (meth)acrylic acid.

***Now, the rejection admits that Okuma does not disclose the urethane-modified epoxy (meth)acrylate (B) in the present invention, but alleges that the component (B) is disclosed in Butler.***

Applicant respectfully disagrees, that is, that component (B) is not disclosed in Butler. Certainly, Butler discloses a composition containing unsaturated polyester resin or vinyl ester resin and a polyisocyanate as a modifier. The rejection mentions polyisocyanate among many kinds of modifiers, and mentions vinyl ester resin between vinyl ester resin and unsaturated polyester resin, in Butler.

Specifically, Butler discloses a composition containing a) unsaturated polyester or vinyl ester resin, b) unsaturated material copolymerizable with a), c) conductive filler, d) copolymerization initiator, and e) rheological modifier such as polyisocyanate. Among these components, the rejection notes only the combination of the components a) and e), other than the combination of the components a) and b). There is no bases for selecting polyisocyanate and vinyl ester resin from the many kinds of possible species.

The rejection alleges the components a) and e) in Butler resemble the components (b-1) and (b-2) in the present invention. Then, the components a) and e) are combined to produce

urethane-modified vinyl ester resin, which corresponds to the vinyl ester-series resins in Okumura.

Moreover, the rejection notes the following description in Okumura:

“The vinyl ester-series resin (e.g., epoxy (meth)acrylate)” [0020], and

“As the radical-polymerizable resin, ...vinyl ester-series resins, unsaturated polyester-series resins, urethane (meth)acrylate, polyester (meth)acrylates and the like. These radical-polymerizable resins can be used singly or in combination” [0018].

Then, the rejection concludes that it would have been obvious to use urethane-modified vinyl ester resin disclosed by Butler for the vinyl-ester resin of Okumura for a combination with urethane (meth)acrylate. The applicant respectfully disagrees.

Certainly, Okumura, [0018], comments “these radical-polymerizable resins [that is, vinyl ester-series resins, unsaturated polyester-series resins, urethane (meth)acrylates, polyester (meth)acrylates and the like] can be used singly or in combination. The radical-polymerizable resins usually has a plurality of  $\alpha$ ,  $\beta$ -ethylenically unsaturated bonds.” This is summarized in Table 3, below.

Table 3: Explanation of [0018] in Okumura

General	Intermediate	Specific Examples
radical-polymerizable resins	resin or oligomer having $\alpha$ , $\beta$ -ethylenically unsaturated bonds (polymerizable unsaturated bonds)	(1) vinyl ester-series resins, (2) unsaturated polyester-series resins, (3) urethane (meth)acrylates, (4) polyester (meth)acrylates

In addition, Okumura, [0055], discloses “Among the radical-polymerizable resins, vinyl ester-series resins ... are preferred.”

*From these descriptions, [0018] and [0055], that Okumura selects vinyl ester resins as the radical-polymerizable resins. It is also clear that only vinyl ester resin is used in Examples in Okumura, and there is no Example that only urethane acrylate is used or both urethane acrylate and vinyl ester resin are used.*

That is, Okumura discloses the combination between (1) vinyl esters and (2) unsaturated polyester-series resins, (3) urethane (meth)acrylates, or (4) polyester (meth)acrylates. To the skilled artisan, the description of [0018] in Okumura, which the rejection notes, means (1) + (2),

(1) + (3), (1) + (4), (1) + (2) + (3), (1) + (3) + (4), (1) + (2) + (4), and (1) + (2) + (3) + (4).

***Among these combinations, the rejection mentions (1) + (3) without any particular reason.***

There is no description which indicates (1) + (3) in any citations including Okumura. Based on these facts, the Okumura does not intend that urethane acrylate is used together with vinyl ester resins.

In contrast, the claimed invention selects only one combination between the components (B) and (C). ***Unique effects, which are not obtained by using only one resin and other resin combinations, can be obtained by the combination between the components (B) and (C).*** Specifically, moldability of the composition is improved by the combination between the components (B) and (C). This is clear from the comparison between Examples 1 to 6 and Comparative Example 1-4.

Therefore, the claims are not *prima facie* obvious over the cited art. Moreover, the second component (C) having the features (1) and (3) is not urethane acrylate. In light of the showing of chemical distinctness above, it is respectfully requested that the rejection be reconsidered and withdrawn.

**Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al (US20020055030A1) in view of Butler (US06251308B1), further in view of Numa et al (US05886082A) for the same rationale recited in prior Office Action dated 8/11/2008. (Office Action, page 6)**

Numa does not compensate for the deficiencies in the combination of Okumura and Butler explained above.

As a result, it is respectfully requested that the rejection be reconsidered and withdrawn.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1105.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Dated: June 17, 2009

Respectfully submitted,

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